BLACK HILLS BEETLES
On The
DIXIE NATIONAL FOREST - UTAH

By: William M. Hurst, Forest Ranger.

Insects and Fire in the order named are the two major destructive agencies to timber on the National Forests of Southern Utah. The work of insects has been particularly noticeable during the past few years on account of the attacks of the Black Hills beetle on the stands of western yellow pine.

In the year 1916 the work of the tree killing insects became noticeable on the Sevier Division of the Dixie National Forest in the western yellow pine region. The condition became conspicuous by the appearance of sorrel top trees standing singly and in groups of varying numbers.

At that time the condition was noticed by the local Forest officers, but was given very little attention, principally because knowledge of the damage that this insect can do was not suspected by the local force.

As time advanced more and more dead trees were noticed, and by the year 1920 the condition was alarming, and attracted the attention of the general public as well as the Forest officers. The aid of Entomologists was invited and several experts from the Bureau of Entomology visited the Forest and after a thorough investigation definitely identified the destructive agent as the Black Hills beetle (Dendroctonus Ponderosae).

During the month of September, 1920, an inspection of the condition was made by the local force assisted by a member of the District headquarters office, at which time it was estimated that approximately 7½% by volume of the western yellow pine sawtimber in the Mammoth Creek region had been killed by the insects. This area contains 75% of the total stand of western yellow pine on the Forest, which amounts to approximately 188,390 M feet, thus the loss in timber during the four year period is estimated to be about 14 million board feet.

In 1920 a cruise of two areas was made by the writer and others for the purpose of determining the progress of the epidemic rapidity of destruction by the beetles. These areas were selected in the heart of the infested district.

Tract number one comprises an area of approximately six hundred acres, and tract number two an area of about three hundred and twenty acres, both of which areas contain almost pure stands of yellow pine.

To determine the rapidity of destruction, the number of dead trees on the areas were counted annually for a period of three years, 1921, 1922 and 1923, during the months of November or December.

The 1922 count showed an increase of 28% over that of 1921, and the count of 1923 showed an increase of 25% over that of 1922.

The above figures give no idea as to the amount of timber killed on the Forest during the epidemic stage which is considered as beginning about 1916, or at least it is thought that the change from the endemic to the epidemic stage took place about that time.

During the season of 1924, strips were cruised for the purpose of determining the amount of timber killed, which showed that approximately 15% by volume had been killed by this destructive agency. In round numbers, this amounts to twenty eight and one quarter million board feet.

The investigations conducted show that the Black Hills beetles emerge from the dead trees and ~~make flight~~ attacks green trees during the period from July 25, to September 15. Usually the flight is for only a short distance as determined by the fact that the freshly infested trees were ordinarily found to be near the dead trees of the previous years attack.

In many cases trees were found which during the first year had been attacked by an insufficient number of the beetles to kill them. However, in following up these observations, it was found that in the majority of cases the trees were eventually attacked and killed either by the following year's flight of the Black Hills beetle, or by some secondary species of beetle.

All ages of western yellow pine trees, especially

from the pole size up, are subject to the attack of the Black Hills beetle, but from studies and observations of the writer, it is found that they prefer trees of mature age, and rarely allow a defective tree to escape. My viewpoint on this matter is that they are cautious of attacking the younger and more healthy trees, because these contain an abundance of sap, which is likely to drown them. However, many cases were found where the trees in the black jack stage had been attacked and had been able to withstand the onslaught.

On this Forest no elaborate control methods have been instituted, such as were used on the Kaibab, although every possible means of salvaging the dead and infested material has been taken. Timber Sale Contracts have stipulated that "infested and dead timber will be given without charge to the operator". As much as possible of the material has been utilized under the Administrative and Free Use regulations. Operators were induced to cut in the infested yellow pine region rather than in more accessible places by giving them the infested and dead material in addition to a low stumpage rate on the uninfested timber. Even then the total amount utilized has been very small as compared with the amount killed during the epidemic.

During the season of 1923 our largest operator

utilized 129 M feet of the dead and infested material that had been dead not to exceed two years. The logs were scaled as fast as they were cut, and some of them were allowed to lie on the millyard until the season of 1924. A number of these logs were again scaled in the spring of 1924, and it was found that they had deteriorated 20% in this length of time. The principal defect found in the dead material is "season check" which runs the entire length of the log or tree. This defect causes most of the trees to become unmerchantable after a period of two years.

From the publications available on this subject, the conclusion is reached that destroying insects are found in the pine timber regions at all times and that the Black Hills beetle is one which will be present in the Forest and which will cause more or less destruction of timber every year.

Past history indicates that the beetles pass from the endemic to the epidemic stage in cycles which vary from twenty to forty years and that they increase gradually from the endemic to the epidemic stage, and decrease in the same manner.

Without question on this Forest, the beetles increased from the endemic to the epidemic stage in a gradual manner as shown by the counts of dead trees in 1921, 1922, and 1923. In 1923, the count of dead trees exceeded the

count of 1922 by 25%, while in 1924 it was found that the insects had suddenly decreased to what is classed as the endemic stage. This fact was determined by cruises at several different places in the yellow pine belt, and a close observation of the entire Forest. During the entire season of 1924, only seven ~~dead~~ infested trees could be found which we were sure had been attacked in 1923.

On one sale area in 1923, all of the infested trees on a given area had been marked for cutting. This area is one that had been used to determine the rapidity of the increase of the insects. In the spring of 1924, this area was again covered for the purpose of marking any freshly infested trees of the 1923 flight, but to our surprise when we found a tree that had the appearance of attach, we also found that it had been marked in the 1923 cruise.

When the disappearance of the beetles was reported it seemed to be something out of the ordinary and representatives from the Bureau of Entomology and Washington offices made visits to the Forest for special examinations, but found conditions as stated above. Developments of the situation will be watched with interest for the next year or two.

We are not sorry that the epidemic of the Black Hills beetle has apparently run its course, but we are not sure that it cannot appear in just as short a period as it

disappeared. If it does recur we hope to be in position to discover it sooner, to realize the damage, and to be able to institute efficient methods of control in the early stages of the epidemic. All Forest officers dealing with pine timber should be on the alert in order that any threatened spread of the beetles may be noted while there is yet time to initiate effective control measures, before they become a real menace.